

Vol 24 No 2
SP 70

The Nuclear Nonproliferation Treaty and the International Atomic Energy Agency

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THE United States and the Union of Soviet Socialist Republics have put forward a Treaty on the Nonproliferation of Nuclear Weapons (NPT) designed to prevent the spread of nuclear weapons beyond those five nations which currently possess them: France, the People's Republic of China (Communist China), the Soviet Union, the United Kingdom, and the United States. The treaty requires that signatories already possessing such weapons not give them to other countries and that signatories not yet possessing nuclear weapons forego accepting them or manufacturing them indigently. To reinforce the latter restraint the treaty obligates states renouncing weapons to accept inspection safeguards on their peaceful nuclear activities, inspection by the International Atomic Energy Agency (IAEA).

IAEA, based in Vienna, came into existence in 1959 and since then has engaged in a mixture of inspection and international technological assistance activities.¹ To date, IAEA has accepted inspection duties under three circumstances: when it had itself arranged for the transfer of fuel or equipment; when some technical assistance agreement between two states had specified IAEA as the inspection agent in place of the donor state; and when any state had unilaterally asked the agency to apply such safeguards over specified facilities.

While the United States and the United Kingdom as donor states had origi-

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¹ For a basic discussion of IAEA see Arnold Kramish, *The Peaceful Atom and Foreign Policy* (New York: Harper and Row, 1963) and Lawrence Scheinman, *International Conciliation: Nuclear Safeguards, the Peaceful Atom, and the IAEA*, March 1969 (No. 572).

nally required inspection by their own representatives, since 1959 they have urged nuclear aid recipients instead to accept IAEA safeguards over the fuel or reactors being transferred. However, the European Atomic Energy Community (Euratom), a recipient of nuclear aid from the United States, has a safeguards system of its own and has therefore been consistently exempted from such requirements for external inspection by representatives of Washington or Vienna. The NPT thus changes the preexisting situation in two ways: It standardizes IAEA safeguards even for the nonnuclear-weapon countries within Euratom (Belgium, the Federal Republic of Germany, Italy, Luxembourg, and the Netherlands) and it requires acceptance of IAEA safeguards everywhere even when projects are not dependent on any foreign assistance.

At first glance few Americans might see any legitimate grounds for countries to resist signing the NPT. Such resistance might well be taken to prove a malicious lust for nuclear weapons. On closer examination other arguments emerge for refusing to sign the treaty. Since maintaining the option to make weapons, even if never exercised, may strengthen a nation's political bargaining position, it may be reluctant to sign away the option. Aside from political power there may be economic problems in submitting to the NPT. Some scientists argue that giving up weapons technology means giving up valuable spin-offs in the peaceful uses of nuclear energy since the technology cannot easily be distinguished. If this argument proves unconvincing, there may still be drawbacks to accepting the international inspection required to reassure other states of one's abstention from bombs.

The last objection thus involves IAEA since the treaty has named it as the international inspection agency. Some nations are sincerely concerned about the drawbacks of inspection; some object for the other reasons cited above but also complain about the prospect of inspection if only to bolster their position of argument. How serious is this objection to the treaty? What are the costs of IAEA safeguards to the inspected nation?

The most general problem is one of economic cost. It will require money and time to inspect nuclear facilities and to make them inspectable. Most of the former cost will fall on the inspection agency, most of the latter on the inspected nations. Generally, the more reliable the inspection or safeguards system, the more expensive and economically wasteful it will be.

Yet close inspection may be necessary if there is to be a serious prospect of detecting a bomb program in time to head it off. By the early 1970's, for example, the Federal Republic of Germany (West Germany) will have enough installed nuclear electrical power facilities to produce plutonium for 200 atomic bombs a year, Japan for 200 bombs, Sweden for 100.² All these capaci-

² For prognoses on the growth and spread of nuclear electrical and plutonium capacity see Leonard Beaton, *Must the Bomb Spread?* (London: Penguin Books [for the Institute of Strategic Studies], 1966).

ties moreover will grow enormously through the 1970's. If there were a ten percent uncertainty as to whether all produced plutonium had been accounted for, a significant clandestine weapons stockpile might indeed seem plausible. Yet reducing the uncertainty from ten percent to five or two percent can prove quite expensive.

Beyond certain degrees of reliability the costs imposed by improved inspection become enormous. Nations being inspected will have to detail trained and expensive personnel to accompany IAEA inspectors on their rounds. In some cases existing equipment might have to be redesigned to make adequate monitoring possible. At other times more detailed and costly bookkeeping procedures will be required. At the extreme, it might even be necessary to shut down operations in some facility to confirm records on the fissionable materials it contains.

A potential host nation may legitimately fear the imposition of such expenses, or it may be exaggerating its fears to embellish its propaganda against the NPT. This article is intended to separate some of the myths from the realities of IAEA safeguards.

APPREHENSIONS ABOUT THE AGENCY

When physically more reliable inspection systems become drastically more costly, reasonable men will differ on what is the appropriate trade-off. At one extreme, IAEA could create such a lax system that the nonproliferation treaty would become politically unconvincing. At the other, inspection might be made more effective in ways which host nations find to be a serious economic burden. All observers will thus be interested in predicting what the agency itself will think appropriate.

To begin, the fear is often expressed that the agency will err on the side of overly strict inspection as the IAEA inspectorate becomes imperiously bureaucratic; in the manner of other bureaucracies it may sometimes demand greater access even when no increase whatsoever in the reliability of safeguards is thereby achieved. This can come about because of personal vanity, institutional imperialism, or excessive legalism.

The most extensive safeguards experience of IAEA and the most articulated complaints against the agency have come in Japan. Much of the "systems" experience of the agency now is derived from the complex of Japanese installations to which it has been given access since 1962. Japanese commentators complain that IAEA representatives are much more legalistic and demanding than American or British inspectors were. Yet the alleged Japanese preference for the good old days of American or British inspectors must be taken with some skepticism. The growth of Japanese nuclear reactor establishments has probably inevitably generated frictions; in 1962 small research

reactors posed much less of a bomb production threat and thus did not require much more than a friendly visit under the bilateral arrangements with the United Kingdom and the United States. Any inspection by outsiders today will probably require the inconveniences that Japanese find so disturbing, e.g., the maintenance of records in a language other than Japanese. Given the freedom of Japanese industrialists to propagandize against ventures which will impose costs on them such charges against Vienna remain to be proven.³

Of course, none of the critics of IAEA is openly arguing that fissionable material should circulate without controls (albeit individual industrialists would not mind being trusted in this cost-free way). Rather they contend that other control systems will be sufficient and thus that IAEA will be redundant as well as costly and troublesome. Japanese will stress the merits of national self-inspection systems while Germans and others will note the advantages of Euratom. If Vienna is determined to inspect all by itself, it will either duplicate or eliminate already existing control bodies.

If one tries to predict how a bureaucracy like IAEA's will really behave with a new and expanded mandate, a wide range of possibilities must be considered. The agency could be quite reasonable and exercise its duties in a spirit of technological common sense or it could become impossibly imperious, interpreting its legal mandate as requiring a maximum of intervention and authority. Perhaps a clue can be found in the likely career patterns of the agency inspectors. If they hope to move on to employment with various private firms or national research organizations, it will hardly do for them to be extremely demanding during their tenure with Vienna. At national levels we are all familiar with the tendency of regulatory agencies to become cooperative (or even overly cooperative) with the industries regulated; perhaps the same phenomenon would arise in safeguards under the NPT. Watching for violations will be dull work in any event, for there may well never be any to detect. Policemen at least have some irreducible minimum of crime to uncover to keep their jobs from becoming too dull. The staffs of IAEA will probably thus have to be given more positive research duties to balance inspection and maintain personnel morale, and this also may impose a limit to the rigor of the safeguards process itself.

Yet other tendencies may dominate. Long-term careers with the IAEA inspectorate might (beneficially or otherwise) preclude agents from preparing jobs for themselves in industry. A new sense of authority may emerge as with some other bureaucracies around the world as the "prevention of bombs" becomes a shield for all delays, all vanities, all sorts of arrogance.

Perhaps the "near-nuclear" states could be reassured because much of the practical experience in safeguards and inspection will have to come from the

³ For Japanese complaints on IAEA nuclear safeguards see *Atoms in Japan* (Tokyo: Japan Atomic Industrial Forum, February 1968), pp. 3-5.

United States in the near future; if Americans are at all sympathetic to the commercial considerations of German and Japanese industrialists, technical experts from the United States Atomic Energy Commission might thus be counted upon to keep Vienna from excessive authoritarianism. Aside from the American commission IAEA will be tempted to draw upon the safeguards experience also of Euratom which to date has a larger backlog in the field. This again should put Vienna into a reasonable mood if and when it descends on West Germany, the Benelux countries, and Italy. IAEA technicians will not like to look technologically foolish; to avoid blunders they will be cooperative with those who know how blunders are to be avoided.

On the basis of past warnings that West Germany is conspiring to manufacture bombs the Russians might urge the agency to impose more and more intensive inspections on Bonn's peaceful nuclear industry. But the Soviet Union has not been forthcoming with much experienced advice on the operation of safeguards, and it indeed may not possess any such extensive experience from its cooperation with the United Arab Republic, Eastern Europe, or Communist China. Even within the Soviet Union itself methods to account for fissionable materials have apparently been less centralized than those of the United States.⁴ The Soviet Union's consistent opposition to IAEA safeguards activities until 1963 hardly fortifies any special Soviet influence on inspection theory within the agency.⁵ The experience with Communist China has indeed made the Russians regret their earlier stands; in recent years they have become a stronger and more doctrinaire advocate of IAEA inspection than the United States; yet the fact that the overwhelming bulk of inspection experience lies with the West might count for something.

Since safeguards technology, like all nuclear technology, cannot long be denied or withheld from IAEA, the agency soon may be able to demand whatever degree of vigilance it sees in its mandate. Rather than the influence of individual American or West German technical experts, restraint may thus require the government-level pressures of both the treaty's coauthors, the United States and the Soviet Union. Perhaps it is then to the realism and common sense of the Great Powers to which one should turn to keep safeguards within the limits of a tolerable burden. The Russians and Americans wrote this treaty and fitted IAEA into the slot of inspector. Surely they will call the tune as much as anyone, and they should realize that the treaty has to be sold and resold to the near-nuclear states if it is to work.

The good will or reasonableness of both superpowers is not taken for granted in most of the relevant countries, however, and the mandate of IAEA would hardly be clear if Russia should insist on greater thoroughness and the United States were alone in defending more flexible standards. For the mo-

⁴ Interviews in Brussels, Washington, and Vienna.

⁵ See Kramish, p. 185.

ment the Russians are apparently saying very little in Vienna about the styles of future safeguard procedures, but it would only be prudent for them to withhold any pressures until the significant states have been lured into signature and ratification. At a later stage, pressures might well be applied for very thorough and troublesome procedures in West Germany or elsewhere. The future attitudes of the United States are also hardly predictable. A number of distinct schools of thought seem to be in contention at all times, that of the Arms Control and Disarmament Agency, the Department of State as a whole, the Atomic Energy Commission, and of course the White House.⁶ The latter remains unpredictable if only because the United States has elections every four years.

SOME FEARS DISPELLED

Yet despite all these ranges of uncertainty it is indeed plausible that Vienna will not be the unreasonable monster various states claim to fear, for a "commonsense" attitude is determined by certain structural aspects of IAEA itself. Whether or not the Great Powers realized this in 1967, the agency will have to maintain other functions besides the policing of nonproliferation and will have to be responsive to states other than the current nuclear-weapon states. The agency will not pursue "airtight inspection," "whatever the cost."

Most significant perhaps is the representation of economically less developed states on the IAEA Board of Governors. Such states are relatively uninterested in the NPT itself, standing neither to gain nor lose directly from it. They do not share the view that the spread of nuclear weapons is either imminently or drastically dangerous. Nor do they have nuclear industries which will suffer from safeguards practices. Such countries are anxious that IAEA continue to be a conduit for the sharing and spread of nuclear technology and that it not become grossly imbalanced toward police duties by its mandate under the treaty. The demand for balance may become most visible in the process of deciding on the agency's budget.

At present the superpowers pay a large share of the IAEA budget. Any increase in the costs of inspection will thus be borne disproportionately by the United States and the Soviet Union. Compared to these nations' defense budgets, such increases would be so trivial that there will be little "self-policing" monetary constraint on Soviet-American desires for inspection. Yet countries such as the Central African Republic and Algeria will hardly be content to see a larger fraction of their IAEA contribution (however relatively small these contributions compared to those of the United States and the Soviet Union) go to paying inspectors rather than technical experts. One alternative

⁶ For a much fuller discussion of American attitudes on halting proliferation see William B. Bader, *The United States and the Spread of Nuclear Weapons* (New York: Pegasus [for the Center of International Studies, Princeton University], 1968).

would thus be a separate budget for inspection underwritten entirely by the nuclear-weapon states. Yet the United States and the Soviet Union will have to be reluctant to accept this, for the logic that they alone should pay the costs would support the view that they alone benefit from the treaty.

Aside from the truly nonnuclear underdeveloped states the "near-nuclear" states fearing excessive inspection will also have a number of seats on the board, and the superpowers will also have to take account of these nations' views and voting power. In fact, the Board of Governors promises to become a forum of complaint against the treaty and its operations for as long as the agency practice of extensive consultation with the governors persists.

Throughout the history of the agency mandates have been developed by near-unanimity in the Board of Governors.⁷ Since IAEA *budgets* must be approved by two-thirds of the board, consensus will be all the more necessary on the funding of any expanded safeguards system. The authority of the board is remarkable for an international organization perhaps in part because it was originally seen as a largely scientific body and its political significance was underrated. Even if the United States and the Soviet Union have the votes to push through an expansion of safeguards which substantially diverts the budget from technical assistance, it is unlikely that this will happen if a significant part of the board would thus go away disgruntled. The needs of the underdeveloped and fears of the near-nuclear supply an incentive for the agency to be quite modest in its plans for expanding the inspectorate and a constraint on the thoroughness with which it can accomplish inspections.

Membership on the IAEA Board of Governors is thus a prize worth contesting, and the question is indeed being bargained over as part of the NPT package. At present ten memberships in effect are permanent, based on considerations of technological advancement and geographic region: Argentina, Australia, Canada, France, India, Japan, the Republic of South Africa, the Soviet Union, the United Kingdom, and the United States. On the basis of somewhat dated assumptions about control of nuclear source materials two more seats alternate between Belgium, Czechoslovakia, Poland, and Portugal. Thirteen remaining members of the 25-man board are elected by the General Conference of all members of the agency within a regional geographic representation pattern.

Confronting this present arrangement are proposals for expansion of the board and/or for a reassignment of the permanent seats. Italy and West Germany clearly seek permanent seats, and Germany may receive one in the end in exchange for a treaty signature. The special status of Belgium and Czechoslovakia is clearly obsolete, as colonies of the former have won independence and uranium stocks of the latter have been exhausted; this fact offers at least a superficial argument for change. An increase in the number of seats filled by

⁷ See Scheinman, *International Conciliation*, No. 572, pp. 17-25.

election of the General Conference would win support among the less developed countries.

Apart from votes in the Board of Governors there are some considerations within the agency staffs which work against any enormous expansions of the inspection function. If the two superpowers should advocate segregating the IAEA budget for safeguards from the budget for more positive research activities, there will be resistance within the agency on the ground that this would break the technical staffs apart. It is presently envisaged that technicians will go back and forth between safeguards and research duties. This will be difficult to arrange with two separate budgets, especially if safeguards have been funded much more generously than other activities. If the agency, for example, aspires to have all its personnel spend not more than six months of the year on safeguards duties with the rest on research, the two may be locked in step even with separate budgets. Increased inspection would require matching budget augmentations for technological assistance; as long as copious developed-state generosity in the latter category is not assured, a restraint remains in effect on the intensity of safeguards. Less developed nations will seek to keep the two kinds of IAEA activity in balance for their own particular interest; the agency has an internal motive to seek the same balance.

For various reasons, IAEA has not felt the NPT to be crucial to the future of the agency. Nor has it felt its own character to be crucial to the success of the treaty. The agency was not really consulted by the superpowers as they were drafting the treaty. The progress (or lack of it) toward winning signatures and ratifications has seemed to depend on events such as the invasion of Czechoslovakia and the American elections or on the specific political situations in countries like West Germany, India, Israel, or Japan. However often agency safeguards are cited by such countries as an objection to the treaty, all such charges have to be discounted somewhat.

Some of this was illustrated at the Conference of Nonnuclear States held at Geneva in September of 1968.⁸ Serving in part as forum for the near-nuclears to voice their cases against the treaty, the conference addressed the agency in various ways. A resolution did call for a "simplification" of safeguards procedures. But others called for revised representation on the Board of Governors and for more aid to underdeveloped countries through IAEA. Some agency representatives were surprised at the extent to which IAEA was drawn into these recriminations against the superpowers, but Vienna still was not taken simply as the sheriff for these powers, and indeed it does not want to be so taken.

It is clear that Vienna desires to see the nonproliferation treaty come into operation and to succeed in its purpose. Realistically, the treaty will give the agency much more function and importance. Yet the safeguards function will

⁸ See "Final Document of the Conference of Non-Nuclear-Weapon States," UN Document A/7277.

have grown whether the treaty takes effect or not since the United States is turning to the agency for safeguards even under bilateral agreements. Given the uncertainties about the treaty's future and the unpleasantness connected with selling it Vienna is not hitching its star to it. Given the agency's own internal structure it will always be seeking to maintain a diversified set of functions.

In the end Vienna may not be crucial to the NPT simply because inspection is not as crucial as we initially assumed. Having inspectors on the premises is a useful reminder to a nation of its treaty obligations; at the margin such a reminder will deter a government which would otherwise choose to violate the treaty. Given the very large quantities of fissionable material which will circulate in 1978, however, it is less likely that any reasonable number of inspectors will be able to detect a violation before it occurs, i.e., early enough to marshal worldwide intervention actually to prevent bombs from being assembled. Safeguards may embarrass and deter violations, and for this a limited staff of inspectors will suffice; preempting a violation will be much more difficult, or perhaps impossible. Inspection and controls by a foreign official are thus important but more in terms of politics and psychology than of physics. The presence of an "outsider" reminds a country that the "outside" world is indeed committed to resisting proliferation.⁹

The relationship of IAEA safeguards to other inspection or material accounting systems can thus be logically ordered. Vienna will bear the hypothetical task of detecting a diversion to military uses after it has occurred. National self-inspection systems will function concurrently but will have to be far more effective. The national systems will ultimately be forced to this higher standard by various requirements apart from basic arms control, e.g., the need to practice good bookkeeping in nuclear materials management to avoid industrial inefficiency, the need to protect the public against the health hazards of radioactive or otherwise toxic wastes, the need to prevent simple theft or other illegal misappropriations of nuclear materials, or the need to maintain the national authority on what clearly have to be national choices. In effect, IAEA can accept a lower standard of rigor for its own safeguards on the expectation that its postaudit will hasten the day when each nation imposes a rigorous auditing system on itself.

At the least, this will require that any decision to violate the nonproliferation treaty will have to be a deliberate and conscious national decision; it will be much more difficult for a group of scientists to appropriate materials without approval from the country's political leadership.

To some extent, this formulation pulls the rug out from under Euratom partisans who cite the comprehensiveness of Brussels's accounting methods

⁹ A similar argument is presented by Lawrence S. Finkelstein, "New Trends in International Affairs," *World Politics*, October 1965 (Vol. 18, No. 1), pp. 117-126.

which IAEA spot inspection systems have not been able to match. Comprehensive accuracy is not crucial to an international safeguards system; the better Euratom's bookkeeping is, the more it approximates Vienna's standards for an acceptable *national* system. (Vienna may indeed become more comprehensive, perhaps with less of a burden, once it has blanket access to entire systems rather than simply to individual facilities, but this is not the central question.)¹⁰

What Vienna is to supply is thus not a more thorough inspection but rather an "outsider" or "adversary" inspection. If Euratom is to prove IAEA redundant here, it must do so on the basis of having more credible adversary mechanisms rather than greater accuracy, but here the logical position becomes muddled. It may indeed be true that Frenchmen can be counted upon to distrust Germans more than Argentinians or Pakistanis; perhaps World War II is remembered as a European civil war in much of the world. Yet if Euratom and the European Communities aspire to become more than a congeries of mutual distrust, the adversary relationship logically has to end. If Europe succeeds in unifying itself, it simply becomes a country like Japan, subject to the same postaudits and the same distrust.

For the short term, Euratom does indeed impose a control on Germany (and on Belgium, etc.) which Japan cannot impose on Japan. By reputation it does so in an efficient and businesslike way; by its existence, furthermore, it presumably contributes to European unity. It might be a real technological and political loss to have Euratom simply fall by the wayside to be replaced by IAEA plus five national inspectorates. (France will not be subject to Vienna safeguards even if it signs the treaty.) Some ad hoc compromise between the prerogatives of Brussels and Vienna will thus have to be negotiated.

Yet even in Germany, the most vocal defender of the Euratom system, there is skepticism on whether this aspect of European unity has enough technological substance to be worth fighting for. The bulk of the functional apparatus of Europe is to be found in the former European Economic Community (EEC) and European Coal and Steel Community (ECSC). As the communities are merged, drawing together two strong pillars and one weak reed, it is not clear that the new pillar would suffer from having the reed omitted altogether.

Euratom to date has done little but control materials. Its budgetary future for research purposes is extremely clouded. However much one claims that it enjoys any methodological advantages over Vienna, it, like IAEA, will have a significantly different task in the 1970's from that of the 1960's, as the volume of material to control and/or police will have grown so substantially. To judge the future obtrusiveness or efficacy of either agency on the basis of past per-

¹⁰ See Arnold Kramish, *The Watched and the Unwatched* (Adelphi Papers, No. 36) (London: Institute for Strategic Studies, June 1967).

formance may be to give them both too easy a test. German physicists working on "black box" automated detection systems and German industrialists operating nuclear reactor power plants are not convinced that Euratom is of urgent technological value, at least not as convinced as foreign ministry spokesmen in Bonn would have it.

THE RANGE OF UNRESOLVED CONFLICT

There are thus constraints on IAEA which preclude it from simply becoming an imperious agent of the United States and the Soviet Union; the agency is not going to hire tens of thousands of inspectors. At the same time, none of the complaining "near-nuclear" states seriously hopes to circumscribe the agency's inspection function into a trivial formality. If the spectrum of possibilities is thus constricted, it still leaves a certain range of conflict which has not yet been resolved. This conflict can be objectified and operationalized in several ways, the two most salient perhaps being the exact numbers of inspectors to be hired and the nature of the specific safeguards agreements to be negotiated.

The budget for inspection and the numbers of inspectors must be fixed at some level, and higher levels will presumably be favored by the superpowers than by the states to be inspected. The exact numbers of inspectors to be hired thus will be significant to all concerned parties and will pose as important a policy decision as any the agency has faced. For the moment, there is only an estimate in circulation of "200 inspectors by 1973."¹¹ It is possible that this figure will be supplemented by perhaps twice as many assistants with less rigorous technical qualifications, and the 200 base may have risen to 800 or 1000 by 1980. Totals in this range should be reassuring to the near-nuclears, dispelling their worst fears. One has only to total up the megawattage of nuclear electrical power that will be at hand by 1973 or 1980 to conclude that IAEA does not aspire to supplant the national inspectorates from country to country.¹²

The limited estimates of inspectors to be hired incidentally rebut another charge against the agency, i.e., that it will never be able to find enough qualified technicians to undertake the inspector safeguards role. For the moment it appears that there will be more applicants for such positions than the agency needs. Continued delay in enactment of the NPT may create some temporary problems if IAEA cannot commit itself early enough to line up its staff, but the production of physicists promises to keep pace with the production of reactors, so long-run problems may solve themselves.

¹¹ Interviews in Vienna.

¹² Estimates of electrical capacities and inspection requirements can be found in U.S. Senate, Foreign Relations Committee, *Hearings on the Nonproliferation Treaty*, 90th Congress, 2nd Session, 1968, pp. 277-288.

Apart from the precise number of inspectors to be hired a second index of IAEA policy arises in the inspection agreements to be signed with each inspected country. A number of earlier documents are relevant here, the IAEA Statute, the nonproliferation treaty itself, the IAEA inspection documents as amended several times since 1961, and the inspection agreements already in effect with several countries. The drift of events is illustrated by the fact that the inspection documents are already considerably less imperious and demanding than the original IAEA Statute. The statute requires (1) deposit of excess fissionable materials with IAEA to prevent stockpiling of such materials; the safeguards documents make no mention of this requirement.¹²

The reconciliation of these mandates with the wording of the NPT itself will also cause some litigation and confusion. The safeguards documents implicitly assume inspection of specific materials supplied under a bilateral or multilateral agreement; the multilateral agreement of the NPT simply subjects all the nuclear materials of a signatory to safeguards which raises the problem of who will specify the materials.

At the time of their adoption the safeguards documents in fact imposed some limit on the agency's access to various countries since the number of visits depends on the electrical (i.e., plutonium) capacity of the reactor and only the larger reactors are subject to continuous inspection or inspection at will.¹³ Yet the incipient inflation of electrical power capacities in fact would soon give Vienna a blank check again, as most reactors will be for power production rather than research and above the minimum plutonium potential required for continuous access. Nations seeking some defined limitation of Vienna's prerogatives must thus turn to the specific safeguards agreements which have been negotiated on a country-to-country basis up to the present and which specify the exact procedures to be followed in safeguards inspections and the exact degree of inspector access for each facility. The agency is now quickly working on a more standard and uniform model safeguards agreement to apply to all new countries coming under Vienna safeguards as well as to replace agreements governing countries so far inspected. This model safeguards agreement will still presumably have to be adjusted for each participating state; it thus in effect will be an amendment or addendum to the

¹² The text of the IAEA Statute which was signed in New York on October 26, 1956, and entered into force on July 29, 1957, can be found in United States Department of State, *American Foreign Policy: Current Documents, 1956* (Department of State Publication 681) (Washington: U.S. Government Printing Office, 1959), pp. 915-933. The safeguards system, approved by IAEA's Board of Governors on January 31, 1961, is contained in IAEA Document INF/CIRC/26, March 31, 1961, and their amendments made on September 28, 1963, appear in IAEA Document INF/CIRC/66, December 3, 1966. The safeguards system and amendments can also be found in United States Arms Control and Disarmament Agency, *Documents on Disarmament, 1961*, pp. 21-33, and *Documents on Disarmament, 1966* (Washington: U.S. Government Printing Office, 1966), pp. 446-460, respectively.

¹³ For a discussion of the early workings of the IAEA safeguards see Mason Willrich, "Safeguarding Atoms for Peace," *American Journal of International Law*, January 1966 (Vol. 60, No. 1), pp. 35-54.

safeguards document, once more to limit Vienna's mandate and reassure the

In the interim, the balance of power on the IAEA Board of Governors will also have become clearer, with the likelihood that the board will have become a serious forum for suggestions and complaints by the near-nuclears. The agency from the director-general on down will have to be concerned for its mandate, and that mandate will hardly be exclusively to stop proliferation. To cite just one uncertainty the attitude of the United Kingdom will be subject to change if it continues to sue for entry into Europe and Euratom, possibly causing it to cease echoing American and Soviet arguments over the treaty simply as the "third" nuclear-weapon state. 1980 is long way off and difficult to predict. One prediction that cannot be excluded is that the agency by then will have become as much an advocate for the near-nuclears as a sheriff for the nuclears.

It is true that the superpowers will be dominant in real terms for much of the future and that real material strength counts for a great deal. Yet the superpowers chose IAEA as an already established legal structure on the assumption that this structure had some strength of its own which might indeed be required if a barrier to further proliferation is to be effective. By seeking to exploit the structure of the agency, however, the Soviet Union and the United

The Treaty on the Nonproliferation of Nuclear Weapons was just ratified by the two authoring powers in November of 1969, almost eighteen months after being opened for signature; it has not yet been ratified by most of the significant near-nuclear states. It is thus perhaps understandable that the agency's leadership will be reluctant to say too much too early about the details of how safeguards will function. Some issues will settle themselves and go away if they can only be postponed. Yet it is also possible that the United States and the Soviet Union are positioning pressures for their particular policy positions until more nations have signed up; for the moment there is no visible Soviet (or American) pressure to increase the totals of inspectors. Normally the agency will not go ahead in face of explicit opposition from either superpower. Yet the treaty will have to be interpreted if it comes into effect, and some of such interpretation almost inevitably will be determined now. It might thus seem optimal for Vienna now slowly to develop something of a mandate which will reassure the near-nuclears, always working within the constraint that issues cannot be broached so prematurely as to force the superpowers to object. No one knows exactly how many inspectors will be employed on safeguards in 1980; but if low estimates cannot be settled for all time, at least some high estimates can be preemptions. Before the need for final decision arises, many other questions may have been settled, including the degree of trust between significant nuclear states, the exact number of states party to the treaty, the degree of great-power disarmament, etc.

States have also chosen to be bound by it, and this may frustrate great-power intentions at some point rather than furthering them.

The treaty's authors had alternative options of dispensing with uniform international inspection altogether or creating a new tailor-made inspector organization for the NPT. The former approach might have made the treaty look too much like the Pact of Paris (Kellog-Briand Pact) of 1928 so that none would really have been reassured by a neighbor state's signature. The latter approach might have made it impossible to sell the treaty to any states that matter. If significant states still profess to be totally adverse to the Vienna agency, this does not prove that they have failed to recognize in it an opportunity to have a significant voice in the implementation of the treaty.

POSSIBLE SOURCES OF TROUBLE

If the structure of IAEA thus requires a "reasonable" approach to safeguards under the NPT, this does not guarantee an absence of troubles. Perhaps the worst burden the agency might encounter under the treaty lies in the Middle East. For the moment it appears that Israel will not sign the treaty and that the Arab states hence will not ratify it. Should this be changed early in the history of the treaty, the world may feel relieved, but the agency will have acquired its first really onerous inspection burden. (India, and therefore Pakistan, will almost certainly not sign the treaty.) In every other instance, there will be no presumption of short-term cheating, and Vienna will be able to exercise the tact and flexibility required to preclude real issues from arising. In the Middle East very thorough safeguards procedures will be required if IAEA is not to lose its credibility. If the Israeli facility at Dimona must be watched very closely, however, Vienna may not be legally or politically able to justify any less severe procedures for Japan or Sweden, and a great deal of room for maneuver might thereby be lost.

The Middle East now has a pathological tradition of violated agreements, of competitive games of deceiving or fooling the international observers of the UN. It may be important or crucial that some reassurance be established that nuclear weapons are not being produced in the area. Yet one must also consider the possibility that the inclusion of the Middle East will force Vienna to become so much of a policeman as to poison the atmosphere it is trying to create. It will not do to have *Der Spiegel* reporting that Israel (or the United Arab Republic) has produced and hidden away some bombs despite the presence of agency personnel. But it will also not do to have every facility in the world watched as closely as Dimona would have to be watched to prevent such stories.

Aside from the Middle East various troubles can arise for the agency from region to region; common sense and goodwill can postpone many of them

but perhaps not all. With regard to West Germany a specific problem may or may not arise on nationality of inspectors. Bonn can probably reject Russians on principle for as long as the Soviet Union does not itself accept inspection; other nations have expressed the identical position in the past. The same principle would not exclude inspectors from Communist countries in East Europe, inspectors that Bonn spokesmen have described as Moscow-directed troublemakers. It is possible that such inspectors might indeed make false accusations or impose unnecessarily strict procedures on West German plants; they might learn operating procedures of value to Russian or other nuclear industries. Even if none of these fears were reasonable in light of the IAEA procedures and experience developed to date, someone in Bonn might be tempted to try rejecting all Communist inspectors without spelling out any explanations of legal principles, perhaps tolerating only those from Yugoslavia and Romania. The agency might thus face a crisis if no Communist inspectors had been into the Federal Republic of Germany after three or four years, and Moscow chose to protest. Better relations between Bonn and the East are indeed possible, and common sense may indeed avert such troubles on both sides. It is obvious that everyone in Vienna hopes for such common sense.

Commercial espionage may create problems with inspectors even from outside the Communist bloc. It is indeed likely that a private American firm, much more so than Russian ones, could exploit some new design which was undergoing test in Germany, perhaps then beating the Germans to a sale in South America. Such espionage has not yet been a problem for IAEA and will only be possible in a small fraction of the field to be inspected since the bulk of nuclear technology is now in the public domain and can no longer be labeled as "secret." Yet an influx of new personnel to fill out augmented inspector staffs can indeed cause some real as well as imagined scandals here.

A related problem can thus arise over inspection of the United States and the United Kingdom which have voluntarily thrown open their peaceful facilities to IAEA safeguards. There is no reason to suspect clandestine bomb production in any such facilities since ample military facilities exist outside the inspected areas. (But is there any reason to suspect such bomb production in a Swedish facility either?) If these facilities were to receive their fair share of safeguards personnel, they might draw off more than 60 percent of the IAEA inspectorate. It is extremely unlikely that IAEA personnel will be deployed in this fashion; Vienna will rather use access to the United Kingdom and the United States primarily for training its personnel, a most valuable opportunity for the agency. Yet this will make it easier for Japanese or other spokesmen to refer to a double standard, to claim that Vienna is engaged in a deceptive hoax here, in that inspection costs and espionage risks will still not be as great for the nuclear-weapon states.

As suggested earlier, lawyers within and outside IAEA foresee some difficul-

ties in defining the agency's legal mandate in bringing together the wording of the NPT and the IAEA safeguards documents.¹⁵ The text of the NPT requires agency "verification" that the ban on weapons and explosives is being complied with. The IAEA Statute has previously used terms like "ensure" and "require" with regard to nonproduction of weapons. If there is a difference in mandate between the two formalizations, it can be used either to make trouble or to avoid it. Legal spokesmen for some nations may insist that IAEA is thus enjoined to be less rigorous on safeguards arising out of the nonproliferation treaty than on its safeguards agreements of the past. This clearly would harden positions in what will be trying negotiations in any event. If it wishes to leave some room for maneuver, the agency in turn can recognize some difference in the mandates to express a flexibility on what safeguards practices in the future will be. But IAEA may instead regard its mandate as relatively nonnegotiable, thus toughening the confrontation from its side.

There can be other confusions about the agency's duties under the NPT. Does it have a ticket to survey the entire landscape to ensure no use of peaceful nuclear activity for military purposes? And when is something so clearly nonpeaceful that it has to be denounced?

For the moment the agency is explicit in avoiding the "landscape" safeguards mandate.¹⁶ Each nation acceding to the treaty will hand over a list of its nuclear facilities, and Vienna will accept the surveillance of them. But what if some country should sign the treaty and then bald-facedly omit a set of facilities from its declaration? Whether the international objection would have to be raised by IAEA or from outside the agency is a question that hopefully may never come up, but such a test of the world's resolve is not beyond a malicious imagination.

Nations might also submit everything for inspection but then brazenly launch projects of only marginal commercial value to prepare the way for more rapid bomb manufacture. A reprocessing plant for plutonium, for example, can be justified as preparing fuel for future fast breeder reactors but also offers weapons-grade material usable for bombs. A state wishing to intimidate its neighbors with this newly acquired weapons potential might therefore want to proclaim its existence rather than hide it. IAEA might be reduced to giving such nations the publicity they desire for their quasi-weapons programs while having nothing clearly illegal to denounce.

If there is an unconfirmed suspicion that the treaty has been violated, the

¹⁵ A much more comprehensive discussion of the treaty's legal ambiguities can be found in Mason Willrich, "The Treaty on Non-Proliferation of Nuclear Weapons: Nuclear Technology Confronts World Politics," *Yale Law Journal*, July 1968 (Vol. 77, No. 8), pp. 1447-1519.

¹⁶ For example, in the Treaty for the Prohibition of Nuclear Weapons in Latin America (the Tlatelolco Treaty) of February 14, 1967, IAEA is entrusted with the task of establishing a Latin American system of safeguarding peaceful nuclear activities but not of verifying that no nuclear weapons are to be found on the landscape. United States Arms Control and Disarmament Agency, *Documents on Disarmament*, 1967 (Washington: U.S. Government Printing Office, 1968), pp. 69-83.

ensuing procedures will not be totally predictable. The agency's inspectorate would presumably have to report its findings to the director-general and to the Board of Governors which in turn might file a complaint with the UN Security Council and General Assembly. Since the veto will apply in Security Council procedures, action might be stymied there if one of the permanent members chose to oppose sanctions against a treaty violator. Yet this underates the significance of Board of Governors action itself, for the endorsement of such a complaint would normally mobilize world concern and opinion against the suspected offender. If pressure against a possible offender is to be avoided, the arena will thus have to be the Board of Governors itself, and the same counting of votes would then occur as on other matters involving the agency with the NPT.

Some states definitely will not sign the NPT in the near future, India (with Pakistan) and Brazil if no other. Yet such states still plan to accept some equipment and fuels from signatory nations, nations which now will be obligated to require IAEA safeguards over such transfers. Vienna thus will have a mixed mandate, blanket coverage of facilities in signatory states and access only to specified facilities in others. Vienna can adopt various approaches to these situations. It could choose to apply pressure for treaty signatures by dragging its heels on the negotiation of specified facility agreements, perhaps on the argument that a full-system approach is inherently so much easier and more efficient that the agency should not be bothered by the older (present) agreements which make a country a checkerboard of inspectable and noninspectable installations. Alternatively it can avoid any pressures on behalf of the treaty, simply continuing to assume any obligations thrust upon it, by the NPT, or by bilateral agreement.

Some experts believe that states such as India or Brazil are deluding themselves if they expect to be able to maintain two separate fuel cycles, one subject to inspection and one independent of it. The economic advantages of blending the two systems will be great, so that over time the entire national nuclear establishment will have become contaminated with IAEA access since Vienna's authority follows any fuel over which it has jurisdiction. This inkblot approach might thus become an obstacle to efforts to produce explosives in "indigenous" facilities while accepting assistance in purely "peaceful" activities. Yet other experts think that such a separation could be maintained at only moderate economic sacrifice if India or Brazil are determined to manufacture explosives. The "inkblot" is potentially fraught with political problems in any event if it involves following IAEA-safeguarded materials through plants which also process other materials. Does the inspector from Vienna have the right to comment on or denounce the handling of these materials? Can the materials indeed be told apart?

Some additional contention will emerge on defining equipment that can

be sold to nations which do not accept IAEA safeguards over them. The treaty forbids sales of "equipment especially designed" for the handling of fissionable materials, but the agency in the end may have to render a judgment on what this wording means. The United States has put forward a "trigger list" of such items which is quite extensive. Countries like Sweden or West Germany will want considerably fewer limitations on what can be sold to India or Brazil.

PEACEFUL NUCLEAR EXPLOSIVES

As one searches for positive IAEA activities to balance out the "negative" role of inspection, one turns naturally to the subject of peaceful nuclear explosives. The nuclear-weapon states stand morally committed in the treaty to facilitate such explosions, and the United States Atomic Energy Commission continues to announce that such explosions can indeed bring great benefits to countries utilizing them. Doubts persist on a number of questions. Are such explosions indeed desirable and effective enough for any civilian purposes to be worth conducting? Will the superpowers indeed be willing to provide many such explosions now? If so, will it be done largely on a bilateral basis or under the auspices of some international agency? If so, will the agency be IAEA? If so, how much real authority will Vienna have?

At the limits of our imagination one could suggest giving Vienna the right to decide whether such explosions will be conducted, i.e., the right to require as well as to veto such explosions. This clearly would enhance the positive prestige and image of the agency but seems well beyond what the superpowers will agree to. It would not necessarily require giving Vienna ownership of such explosives (thus making IAEA the "sixth nuclear power") but even that would not be so illogical. If we trust Vienna to stop proliferation, we can trust it with nuclear explosives; as it is, the agency in principle could always conspire with some country to run off a few plutonium bomb explosives, and who could then bring suit?

Giving Vienna a veto (in the sense of requiring that all such explosions be conducted under international auspices) may be more likely, and this might have been the result of accepting Swedish proposals for text amendments in the NPT.¹⁷ Yet this would again round out the negative rather than positive side of the agency's functions. Most probably, Vienna may become a broker through which nations might place their requests for nuclear explosives, thus removing a need for direct application to a donor nation where this would be politically awkward. This somewhat resembles Vienna's role now as a conduit for technological assistance but does not greatly enhance the agency's prestige.

¹⁷ See Resolution L in the "Final Document of the Conference of Non-Nuclear-Weapon States," UN Document A/7277.

It is now almost certain that any international involvement in the peaceful nuclear explosives will come through IAEA. Yet this was not determined from the outset, and the relevant section of the NPT refers merely to "appropriate international procedures." It is not clear at first glance why there should have been any doubts on the relevance of the Vienna agency here. IAEA indeed has no direct practical experience in the field, but its experience at least covers the nuclear area better than that of any other international body. Both the United States and the Soviet Union are now determined that IAEA be the body described in the treaty. Bureaucratic rivalries between the agency and the UN Secretariat can account for part of the movement for an alternative peaceful nuclear explosives body. Aside from that there is of course the continuing resistance to the NPT; there are states which will adopt any arguments, even contradictory arguments, to lay a groundwork for delaying signature. If peaceful explosives under the NPT will only be offered to countries adhering to it, then IAEA in administering them would become party to a discriminatory mechanism intended to pressure nations into signing. There will inevitably be nations which will refuse to sign, while retaining their membership in IAEA; these may well object to the agency becoming more and more bound to the provisions of the treaty.

Other recalcitrants in turn can object that the treaty does not transfer enough authority on peaceful explosives to the agency, in effect demanding more IAEA involvement in these ventures as their price for signature.

CONCLUSION

As with all international disputes, posturing and overstatement have occurred on both sides of the issue. The novelty of this dispute over the treaty emerges from the unique alignment of states for and against it rather than from the style of diplomatic behavior. In this arena of propaganda and myth IAEA has thus been caricatured by opponents of the treaty and taken for granted by the treaty's authors. In reality, the Vienna agency will play a much more complicated role altogether appropriate to the complications that must ensue as the treaty goes into effect. Diplomats privy to the issue may indeed already see IAEA for what it is. Over time their national interests may allow them to become more candid in describing it.

It is simply too early to tell whether IAEA safeguards will have to be obtrusive to be politically effective. Some of the unknowns hinge on technology, but many others depend on the political climates of the future. National spokesmen who profess to be certain that IAEA safeguards will have to be burdensome are distorting what their scientists tell them or assuming the worst possible political environments. Defenders of the NPT and IAEA who claim to foresee no problems at all are conversely being overly sanguine.

An examination of the political nature of the agency itself at least suggests a stronger impetus for moderation and compromise than we might otherwise have expected. The agency's Board of Governors indeed promises to be the arena in which differences of opinion on the safeguards question will be thrashed out; IAEA's staffs in turn have internal incentives to become a source of technological good sense, a source which creatively generates modes of compromise rather than issues of dispute.

Integration and Disintegration in Franco-German Relations, 1954-1965

DONALD J. PUCHALA

THE object of this study is to determine how close to, or how far from, international integration France and the Federal Republic of Germany (West Germany) moved between 1954 and 1965. Results presented here are revealing though probably not astonishing: While some indices of international integration suggest growing assimilation between Frenchmen and West Germans at the societal level, others, paradoxically, show marked deterioration in French and West German coordination and amalgamation at the intergovernmental level. What is important about these findings is that they follow predictably from some theories of international integration and raise questions about others.

INTERNATIONAL INTEGRATION: A MODEL FOR DESCRIPTIVE ANALYSIS

So much controversy has surrounded the question, "What is international integration?" that we now have almost as many definitions of "integration" as we have scholars studying it. By now, though, most students have come to conclude that international integration is a many-faceted phenomenon.¹ Ac-

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¹ In this regard see especially Joseph S. Nye's thoughtful and stimulating, "Comparative Regional Integration: Concept and Measurement," *International Organization*, Autumn 1968 (Vol. 22, No. 4), pp. 855-880. I am in agreement with Nye's three-dimensional conceptualization of the integration phenomenon (economic integration, political integration, and social integration) as well as with his analytical refinement of each dimension. The reader will note that the conceptualization in two dimensions that I present here in no way contradicts Nye's presentation. I believe that we agree upon the variety of component phenomena and processes involved in international integration. Hence, my two-dimensional